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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
| 09/817,155 | 03/27/2001 | Masato Hasegawa | 50395-096 | 7094 |

7590 07/11/2005

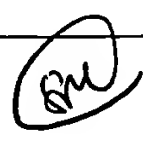
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| EXAMINER | |
| LEE, SHUN K | |

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| ART UNIT | PAPER NUMBER |
| 2878 | |

DATE MAILED: 07/11/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

| | | | |
|------------------------------|-------------------------------|---------------------------------|---|
| Office Action Summary | Application No. 09/817,155 | Applicant(s) HASEGAWA ET AL. | |
| | Examiner Shun Lee | Art Unit 2878 |  |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 1/5/05, 4/21/05, & 4/22/05.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 57-98 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 57-75 and 78-98 is/are rejected.
- 7) ☒ Claim(s) 76 and 77 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 14 May 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 22 April 2005 has been entered.

Information Disclosure Statement

2. The information disclosure statement filed on 3 September 2004 does not fully comply with the requirements of 37 CFR 1.98 because: it lacks a legible copy (*i.e.*, the axis labels are illegible) of each publication or that portion which caused it to be listed. Since the submission appears to be *bona fide*, applicant is given **ONE (1) MONTH** from the date of this notice to supply the above mentioned omissions or corrections in the information disclosure statement. **NO EXTENSION OF THIS TIME LIMIT MAY BE GRANTED UNDER EITHER 37 CFR 1.136(a) OR (b).** Failure to timely comply with this notice will result in the above mentioned information disclosure statement being placed in the application file with the noncomplying information **not** being considered. See 37 CFR 1.97(i).

Claim Objections

3. Claims 62, 68, and 95 are objected to because of the following informalities:

- (a) in claim 62, "the resin part" on line 7 should probably be --the resin layer-- (see "a resin layer" on line 2 in claim 62);
- (b) in claim 68, "he" on line 2 should probably be deleted; and
- (c) in claim 95, "BN" on line 7 should probably be --B/A-- (see "B/A" on pg. 39, lines 20-22 and Table 3 on pg. 37).

Appropriate correction is required.

4. Claims 76 and 77 are objected to under 37 CFR 1.75(c) as being in improper form because a multiple dependent claim should refer to other claims in the alternative only and cannot depend from any other multiple dependent claim. See MPEP § 608.01(n). Accordingly, the claims have not been further treated on the merits.

Claim Rejections - 35 USC § 112

1. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

2. Claims 60-63, 65, 66/60, 66/62, 67/66/60, 67/66/62, 68/60, 68/62, 69/68/60, 69/68/62, 74, 75, 82-86, and 93-98, are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Independent claim 60 and 62 recite the limitation "a light-shielding ratio of the lens body, Ti/Tv , is greater than the product of the light-shielding ratio of the ceramic

part and that of the resin part". Applicant states (second paragraph on pg. 13 of remarks filed 22 April 2005) that support for the claim limitation of $Ti/Tv(lens) > Ti/Tv(ceramic\ part) \times Ti/Tv(resin\ part)$ is found in Table 5 of Example 3 of the present disclosure. However, Table 5 of Example 3 only provides values for $Ti/Tv(lens)$ of certain average thickness of a resin layer coated on the ceramic part. Values of Ti/Tv in Table 4 cannot be used for $Ti/Tv(resin\ part)$ since the values of Ti/Tv in Table 4 were obtained from resin samples with mirror finished surfaces (see pg. 35, lines 12-14). Moreover, even if values of Ti/Tv in Table 4 were used, No. 3 in Table 4 have a $Ti/Tv(lens) = 4474$ which is greater than 3487 (*i.e.*, $Ti/Tv(ceramic\ part) = 3170 \times Ti/Tv(resin\ part) = 1.1$). Whereas No. 6 in Table 4 have a $Ti/Tv(lens) = 9889$ which is less than 11729 (*i.e.*, $Ti/Tv(ceramic\ part) = 3170 \times Ti/Tv(resin\ part) = 3.7$). Therefore, there does not appear to be a written description of the new claim limitation in the application as filed.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation

under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

7. Claims 57-59, 64, 78, and 87-90 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tower *et al.* (US 6,020,628) in view of Grossinger *et al.* (US 5,712,622), Silvestrini *et al.* (US 4,323,619), and Raj *et al.* (US 5,183,602).

In regard to claims **57-59, 64, and 87-90**, Tower *et al.* disclose (Figs. 1 and 5) a sensor, having a lens body (12), comprising ceramic (column 2, line 63 to column 3, line 7), a supporting part (16, 60), which supports said lens body (12), and a detection part (*i.e.*, optically active portion 32 of the electronic device 24), which detects the light that has been transmitted through said lens body (12). While Tower *et al.* also disclose (column 2, line 63 to column 3, line 7) that the lens body is formed from any suitable ceramic or glass such that light of a desired wavelength will pass through the lens body with minimal distortion or attenuation, the sensor of Tower *et al.* lacks that the lens body contains a pigment (*e.g.*, carbon black, graphite, diamond, titanium black, an iron oxide, molybdenum, tungsten, iron, nickel, cobalt, copper, silver, a compound thereof, TiO₂, BN, AlN, ZnO, or ZnS) with an average particle diameter of 0.01 to 2 μ m that shields visible light with the degree of dispersion R of the 0.001 to 1 mass % (or 0.05 to 2 mass %) pigment in the lens body less than or equal to 10% so that the value of the ratio Ti/Tv of the lens body is ≥ 5 , ≥ 15 , ≥ 150 or ≥ 300 (*i.e.*, $Ti \geq 5Tv$, $Ti \geq 15Tv$, $Ti \geq 150Tv$, or $Ti \geq 300Tv$), wherein Ti is a linear transmittance of light of 8 to 12 μ m wavelength and

Tv is linear transmittance of 830 nm laser beam. Grossinger *et al.* teach (column 2, lines 1-20; column 4, lines 40-55) to provide a lens with pigment particles (e.g., 10% or a considerably reduced pigment amount) that shields visible light (i.e., $T_v \sim 0$) from the sensor without distorting or attenuating infrared radiation (i.e., $T_i \sim 1$). Further, Silvestrini *et al.* teach (column 2, lines 50-66; column 3, lines 51-62; column 4, lines 58-65) to provide a perfect dispersion of a pigment such as 0.2% to 0.8% by weight of 0.5 μm carbon black of the MT type in order to absorb light of less than 3 μm wavelength. In addition, Raj *et al.* teach (column 4, line 37 to column 5, line 15) that particles can be uniform dispersed in a ceramic. Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention to perfectly disperse (e.g., $\leq 10\%$ R) a 0.01 to 2 μm pigment at 0.001 to 2 mass % (e.g., 0.2% 0.5 μm carbon black) in the ceramic lens body of Tower *et al.*, in order to shield the optically active portion of the electronic device from visible light (i.e., $5T_v \sim 0$, $15T_v \sim 0$, $150T_v \sim 0$, or $300T_v \sim 0$) without distorting or attenuating the desired wavelengths of infrared radiation (e.g., desired 8 to 12 μm wavelengths with $T_i \sim 1$ which is greater than $5T_v$, $15T_v$, $150T_v$, or $300T_v$) as taught by Grossinger *et al.*

In regard to claim 78 which is dependent on claim 57, Tower *et al.* also disclose (column 3, lines 35-45, column 4, lines 44-53) that said supporting part (16, 60) is comprised of metal.

8. Claims 66/57, 67/66/57, 91, and 92 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tower *et al.* (US 6,020,628) in view of Grossinger *et al.* (US 5,712,622), Silvestrini *et al.* (US 4,323,619), and Raj *et al.* (US 5,183,602) as

applied to claims 57 and 90 above, and further in view of Carnall, Jr. *et al.* (US 3,131,238).

In regard to claims **66** and **67** (which are dependent on claim 57) and claim **91** (which is dependent on claim 90), while Tower *et al.* also disclose (column 2, lines 63-66) that the lens body is formed from any suitable ceramic or glass such that that light of a desired wavelength will pass through the lens body with minimal distortion or attenuation, the modified sensor of Tower *et al.* lacks that the main component of said ceramic of said lens body is zinc sulfide (ZnS) having $\geq 40\%$ or $\geq 50\%$ linear light transmittance at 8 to 12 μm wavelength. However, zinc sulfide ceramic lenses are well known in the art. For example, Carnall, Jr. *et al.* teach (column 5, line 50 to column 6, line 62) a 1.6 mm thick zinc sulfide infrared optical element have a linear light transmittance of $\geq 40\%$ (e.g., 75% at 8 μm wavelength). Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention that a suitable material for the lens body of Tower *et al.* is zinc sulfide which has a linear light transmittance of $\geq 40\%$ at a desired infrared wavelength (e.g., 8 to 12 μm wavelength), in order to pass the desired infrared wavelength light (e.g., 8 μm wavelength) through the lens body with minimal distortion or attenuation.

In regard to claim **92** which is dependent on claim 91, Tower *et al.* in view of Grossinger *et al.* and Silvestrini *et al.* is applied as in claim 88 above.

9. Claims 68/57, 69/68/57, 91, and 92 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tower *et al.* (US 6,020,628) in view of Grossinger *et al.*

(US 5,712,622), Silvestrini *et al.* (US 4,323,619), and Raj *et al.* (US 5,183,602) as applied to claims 57 and 90 above, and further in view of Roy *et al.* (US 3,974,249).

In regard to claims **68** and **69** (which are dependent on claim 57) and claim **91** (which is dependent on claim 90), while Tower *et al.* also disclose (column 2, line 63 to column 3, line 7) that the lens body is formed from any suitable ceramic (e.g., the main component is MgAl_2O_4 which is also referred to as spinel) or glass such that that light of a desired wavelength will pass through the lens body with minimal distortion or attenuation, the sensor of Tower *et al.* lacks that the MgAl_2O_4 lens body has $\geq 40\%$ or $\geq 50\%$ linear light transmittance at 3 to 5 μm wavelength. However, the properties of MgAl_2O_4 are well known in the art. For example, Roy *et al.* teach (column 5, lines 6-55) that MgAl_2O_4 has $\geq 40\%$ linear light transmittance at 3 to 5 μm wavelength. Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention that the MgAl_2O_4 lens body of Tower *et al.* have $\geq 40\%$ linear light transmittance at 3 to 5 μm wavelength.

In regard to claim **92** which is dependent on claim 91, Tower *et al.* in view of Grossinger *et al.* and Silvestrini *et al.* is applied as in claim 88 above.

10. Claims 57-59, 64, 70, 71, and 87-90 are rejected under 35 U.S.C. 103(a) as being unpatentable over Castleman (US 6,153,881) in view of Grossinger *et al.* (US 5,712,622), Silvestrini *et al.* (US 4,323,619), and Raj *et al.* (US 5,183,602).

In regard to claims **57-59**, **64**, and **87-90**, Castleman discloses (Figs. 8 and 9) a sensor, having a lens body (232), comprising ceramic (*i.e.*, sapphire; column 13, lines 36-47), a supporting part (230), which supports said lens body (232), and a detection

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part (236), which detects the light that has been transmitted through said lens body (232). The sensor of Castleman lacks that the lens body contains a pigment (e.g., carbon black, graphite, diamond, titanium black, an iron oxide, molybdenum, tungsten, iron, nickel, cobalt, copper, silver, a compound thereof, TiO_2 , BN, AlN, ZnO, or ZnS) with an average particle diameter of 0.01 to 2 μm that shields visible light with the degree of dispersion R of the 0.001 to 1 mass % (or 0.05 to 2 mass %) pigment in the lens body less than or equal to 10% so that the value of the ratio Ti/Tv of the lens body is ≥ 5 , ≥ 15 , ≥ 150 or ≥ 300 (i.e., $\text{Ti} \geq 5\text{Tv}$, $\text{Ti} \geq 15\text{Tv}$, $\text{Ti} \geq 150\text{Tv}$, or $\text{Ti} \geq 300\text{Tv}$), wherein Ti is a linear transmittance of light of 8 to 12 μm wavelength and Tv is linear transmittance of 830 nm laser beam. Grossinger *et al.* teach (column 2, lines 1-20; column 4, lines 40-55) to provide a lens with pigment particles (e.g., 10% or a considerably reduced pigment amount) that shields visible light (i.e., $\text{Tv} \sim 0$) from the sensor without distorting or attenuating infrared radiation (i.e., $\text{Ti} \sim 1$). Further, Silvestrini *et al.* teach (column 2, lines 50-66; column 3, lines 51-62; column 4, lines 58-65) to provide a perfect dispersion of a pigment such as 0.2% to 0.8% by weight of 0.5 μm carbon black of the MT type in order to absorb light of less than 3 μm wavelength. In addition, Raj *et al.* teach (column 4, line 37 to column 5, line 15) that particles can be uniform dispersed in a ceramic. Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention to perfectly disperse (e.g., $\leq 10\%$ R) a 0.01 to 2 μm pigment at 0.001 to 2 mass % (e.g., 0.2% 0.5 μm carbon black) in the sensor of Castleman, in order to shield the optically active portion of the electronic device from visible light (i.e., $5\text{Tv} \sim 0$, $15\text{Tv} \sim 0$, $150\text{Tv} \sim 0$, or $300\text{Tv} \sim 0$) without distorting or attenuating the desired

wavelengths of infrared radiation (e.g., desired 8 to 12 μm wavelengths with $T_i \sim 1$ which is greater than 5Tv, 15Tv, 150Tv, or 300Tv) as taught by Grossinger *et al.*

In regard to claims **70** and **71** which are dependent on claim 57, Castleman also discloses (column 13, lines 11-20 and 36-47) that said supporting part is comprised of resin (*i.e.*, plastic housing).

11. Claims 72 and 73 are rejected under 35 U.S.C. 103(a) as being unpatentable over Castleman (US 6,153,881) in view of Grossinger *et al.* (US 5,712,622), Silvestrini *et al.* (US 4,323,619), and Raj *et al.* (US 5,183,602) as applied to claims 70 and 71 above, and further in view of Erismann (US 5,818,337).

In regard to claims **72** and **73** which are dependent on claims 70 or 71, while Castleman also discloses (column 13, lines 11-20 and 36-47) a plastic housing, the sensor of Castleman lacks that the plastic is high-density polyethylene. However, plastic housings are well known in the art. For example, Erismann teaches (column 2, lines 50-62) that a plastic housing comprising lens can be formed from a plastic substantially transparent to infrared radiation such as high-density polyethylene. Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention to provide a known plastic for the plastic housing of Castleman such as high-density polyethylene which is substantially transparent to infrared radiation.

12. Claims 79 and 80 are rejected under 35 U.S.C. 103(a) as being unpatentable over Castleman (US 6,153,881) in view of Grossinger *et al.* (US 5,712,622), Silvestrini *et al.* (US 4,323,619), and Raj *et al.* (US 5,183,602) as applied to claim 57 above, and further in view of Adachi *et al.* (US 4,302,674).

In regard to claim **79** which is dependent on claim 57, the modified sensor of Castleman lacks that said supporting part includes a cylindrical part, which is formed between the portion of said lens body that transmits light and said detection part. Adachi *et al.* teach (column 5, lines 46-58) to provide a cylindrical part in order to receive only substantially perpendicular radiation relative to the detection part. Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention to provide a cylindrical part between the lens body and the detection part in the modified sensor of Castleman, in order to receive only substantially perpendicular radiation relative to the detection part as taught by Adachi *et al.*

In regard to claim **80** which is dependent on claim 79, Castleman is applied as in claims 70 and 71 above.

13. Claim 81 is rejected under 35 U.S.C. 103(a) as being unpatentable over Castleman (US 6,153,881) in view of Grossinger *et al.* (US 5,712,622), Silvestrini *et al.* (US 4,323,619), Raj *et al.* (US 5,183,602), and Adachi *et al.* (US 4,302,674) as applied to claim 80 above, and further in view of Erismann (US 5,818,337).

In regard to claim **81** which is dependent on claim 80, Erismann is applied as in claims 72 and 73 above.

Response to Arguments

14. Applicant's arguments (second paragraph on pg. 13 of remarks filed 22 April 2005) with respect to some of the new claims have been considered but are moot in view of the new ground(s) of rejection.

15. Applicant's arguments (last paragraph on pg. 10 to first paragraph on pg. 13) filed 22 April 2005 have been fully considered but they are not persuasive.

Applicant argues that ceramics rarely allow perfect dispersion of minute amounts of additives. Examiner respectfully disagrees. A uniform dispersion of particles in a ceramic is known in the art. For example, Raj *et al.* teach (column 4, line 37 to column 5, line 15) a uniform dispersion of diamond particles in zinc sulfide ceramic by hot pressing an intimate powder mixture and dispersion obtained by shear-milling and freeze-milling. Therefore, Applicant's arguments are not persuasive.

Conclusion

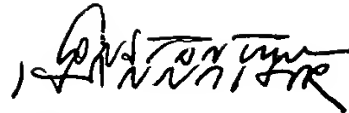
16. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Shun Lee whose telephone number is (571) 272-2439. The examiner can normally be reached on Tuesday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Porta can be reached on (571) 272-2444. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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CONSTANTINE HANNAHER
PRIMARY EXAMINER
GROUP ART UNIT 2878

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